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**EASTLEIGH DISTRICT LOCAL PLAN  
LAND AT BOTLEY  
Reconnaissance Survey**

**Agricultural Land Classification  
May 1996**

**Resource Planning Team  
Guildford Statutory Group  
ADAS Reading**

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# AGRICULTURAL LAND CLASSIFICATION REPORT SUMMARY REPORT

## EASTLEIGH DISTRICT LOCAL PLAN, LAND AT BOTLEY

### INTRODUCTION

1. This report presents the findings of a reconnaissance Agricultural Land Classification (ALC) survey of 66 ha of land on two adjacent sites on the northern fringe of the village of Botley, east of Southampton in Hampshire; the sites are separated by the B3354. The survey was carried out during May 1996.
2. The survey was commissioned by the Ministry of Agriculture, Fisheries and Food (MAFF) Land Use Planning Unit, Reading in connection with the review of the Eastleigh District Local Plan. This survey supersedes previous ALC surveys on this land.
3. The work was conducted by members of the Resource Planning Team in the Guildford Statutory Group in ADAS. The land has been graded in accordance with the published MAFF ALC guidelines and criteria (MAFF, 1988). A description of the ALC grades and subgrades is given in Appendix I.
4. At the time of survey the land use on the site was a mixture of permanent grass or bare or recently cultivated ground. The areas mapped as 'Other' include agricultural buildings and woodland. Small urban areas and areas of agricultural buildings have not been mapped at this reconnaissance scale.

### SUMMARY

5. The findings of the survey are shown on the enclosed ALC map. The map has been drawn at a scale of 1:50,000; it is accurate at this scale but any enlargement would be misleading.
6. The area and proportions of the ALC grades and subgrades on the surveyed land are summarised in Table 1.

Table 1: Area of grades and other land

Grade/Other land	Area (hectares)	% Total site area
2	6.0	9.1
3a	4.0	6.1
3b	54.0	81.8
Other land	2.0	3.0
Total site area	66.0	100

7. The fieldwork was conducted at an average density of one boring per seven hectares. A total of nine borings and one soil pit was described.

8. The majority of the area has been classified as Subgrade 3b (moderate quality land) as a result of a soil wetness limitation related to poorly structured clay subsoils. Two limited areas of higher land have been classified as better quality (Grade 2, very good quality; Subgrade 3a, good quality). Here, there is still a soil wetness limitation; where the highest quality land has been mapped, the limitation is least severe.

## FACTORS INFLUENCING ALC GRADE

### Climate

9. Climate affects the grading of land through the assessment of an overall climatic limitation and also through interactions with soil characteristics.

10. The key climatic variables used for grading this site are given in Table 2 and were obtained from the published 5km grid datasets using the standard interpolation procedures (Met. Office, 1989).

Table 2: Climatic and altitude data

Factor	Units	Values		
Grid reference	N/A	SU503133	SU506139	SU509139
Altitude	m, AOD	50	50	55
Accumulated Temperature	day°C (Jan-June)	1497	1497	1491
Average Annual Rainfall	mm	844	847	850
Field Capacity Days	days	172	173	173
Moisture Deficit, Wheat	mm	105	104	104
Moisture Deficit, Potatoes	mm	98	97	96

11. The climatic criteria are considered first when classifying land as climate can be overriding in the sense that severe limitations will restrict land to low grades irrespective of favourable site or soil conditions.

12. The main parameters used in the assessment of an overall climatic limitation are average annual rainfall (AAR), as a measure of overall wetness, and accumulated temperature (AT0, January to June), as a measure of the relative warmth of a locality.

13. The combination of rainfall and temperature at this site mean that there is no overall climatic limitation. Local climatic factors are also not believed to be significant; the area is climatically Grade 1.

### Site

14. The majority of the site is flat and relatively lowlying (50 m). A minor stream cuts through the south-west of the site, but even this only has a very minor flood plain, which does not significantly disrupt the topography. Two areas of slightly higher land occur on the site, but the gradients and topography are slight and very rounded. Microrelief and flooding are not significant in the survey at the current scale of mapping

## **Geology and soils**

15. The published geological information for the site (BGS, 1987) shows the underlying geology to be mostly Bracklesham Beds, with smaller areas of Valley Gravel and Earley Sands.

16. The published soils information for the site (SSEW, 1983) shows the area to be a mixture of Wickham 3 association (described as slowly permeable, seasonally waterlogged, fine loamy over clayey and similar more permeable soils with slight waterlogging) and Hamble 2 association (described as deep, stoneless, well-drained silty soils and similar soils affected by groundwater).

## **AGRICULTURAL LAND CLASSIFICATION**

17. The details of the classification of the site are shown on the attached ALC map and the area statistics of each grade are given in Table 1, page 1.

18. The location of the auger borings and pits is shown on the attached sample location map and the details of the soils data are presented in Appendix III.

### **Grade 2**

19. The slightly higher land in the east and south-east section of the western site has been placed in this grade due to a slight soil wetness limitation. Clay lower subsoils have been assessed as slowly permeable, but there is no evidence of gleying within the top 40 cm, allowing these soils to be placed in Wetness Class III (see Appendix II). These soils also have light topsoils, typically medium sandy loams, which, in combination with the prevailing field capacity level (173 days) and the wetness class, creates only a slight workability limitation. The poorly structured clays are just thick enough to be considered slowly permeable; beneath them, the clay subsoils become moderate in terms of their structural condition.

### **Subgrade 3a**

20. The slightly higher land in the eastern site has been placed in this grade, again as a result of a soil wetness limitation. The soils are not very dissimilar to the Grade 2 soils; they have slowly permeable lower subsoils and are not gleyed within 40 cm and are also placed in Wetness Class III. The key difference is the topsoil texture; the topsoils are heavier, being medium clay loams. This heavier topsoil combines with the wetness class and the field capacity level to impose a more significant wetness/workability limitation. As a result, there will be a reduced range of days when the soil is in a suitable condition for cultivation, trafficking by machinery or grazing by livestock.

### **Subgrade 3b**

21. The majority of the site falls into this grade as a result of a significant soil wetness limitation. Soil Pit 1 is representative of the soils in this map unit. The topsoils are generally medium clay loams which overlie clay subsoils that are slowly permeable at shallow depths (the structure of these subsoils has been assessed as massive). As a result, the profiles are gleyed within the top 40 cm and fall into Wetness Class IV. This degree of wetness, in

combination with the topsoil texture and the field capacity range, limits such land to Subgrade 3b.

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## SOURCES OF REFERENCE

British Geological Survey (1987) *Sheet No.315, Southampton*.  
BGS: London.

Ministry of Agriculture, Fisheries and Food (1988) *Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land*. MAFF: London.

Met. Office (1989) *Climatological Data for Agricultural Land Classification*.  
Met. Office: Bracknell.

Soil Survey of England and Wales (1983) *Sheet 6*.  
SSEW: Harpenden.

Soil Survey of England and Wales (1984) *Soils and their Use in South East England*  
SSEW: Harpenden

## APPENDIX I

### DESCRIPTIONS OF THE GRADES AND SUBGRADES

#### **Grade 1: Excellent Quality Agricultural Land**

Land with no or very minor limitations to agricultural use. A very wide range of agricultural and horticultural crops can be grown and commonly includes top fruit, soft fruit, salad crops and winter harvested vegetables. Yields are high and less variable than on land of lower quality.

#### **Grade 2: Very Good Quality Agricultural Land**

Land with minor limitations which affect crop yield, cultivations or harvesting. A wide range of agricultural or horticultural crops can usually be grown but on some land of this grade there may be reduced flexibility due to difficulties with the production of the more demanding crops such as winter harvested vegetables and arable root crops. The level of yield is generally high but may be lower or more variable than Grade 1 land.

#### **Grade 3: Good to Moderate Quality Land**

Land with moderate limitations which affect the choice of crops, the timing and type of cultivation, harvesting or the level of yield. When more demanding crops are grown, yields are generally lower or more variable than on land in Grades 1 and 2.

#### **Subgrade 3a: Good Quality Agricultural Land**

Land capable of consistently producing moderate to high yields of a narrow range of arable crops, especially cereals, or moderate yields of a wide range of crops including cereals, grass, oilseed rape, potatoes, sugar beet and the less demanding horticultural crops.

#### **Subgrade 3b: Moderate Quality Agricultural Land**

Land capable of producing moderate yields of a narrow range of crops, principally cereals and grass, or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year.

#### **Grade 4: Poor Quality Agricultural Land**

Land with severe limitations which significantly restrict the range of crops and/or the level of yields. It is mainly suited to grass with occasional arable crops (e.g. cereals and forage crops) the yields of which are variable. In moist climates, yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable land.

#### **Grade 5: Very Poor Quality Agricultural Land**

Land with severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

## APPENDIX II

### SOIL WETNESS CLASSIFICATION

#### Definitions of Soil Wetness Classes

Soil wetness is classified according to the depth and duration of waterlogging in the soil profile. Six soil wetness classes are identified and are defined in the table below.

Wetness Class	Duration of waterlogging <sup>1</sup>
I	The soil profile is not wet within 70 cm depth for more than 30 days in most years. <sup>2</sup>
II	The soil profile is wet within 70 cm depth for 31-90 days in most years or, if there is no slowly permeable layer within 80 cm depth, it is wet within 70 cm for more than 90 days, but only wet within 40 cm depth for 30 days in most years.
III	The soil profile is wet within 70 cm depth for 91-180 days in most years or, if there is no slowly permeable layer present within 80 cm depth, it is wet within 70 cm for more than 180 days, but only wet within 40 cm depth for between 31-90 days in most years.
IV	The soil profile is wet within 70 cm depth for more than 180 days but not wet within 40 cm depth for more than 210 days in most years or, if there is no slowly permeable layer present within 80 cm depth, it is wet within 40 cm depth for 91-210 days in most years.
V	The soil profile is wet within 40 cm depth for 211-335 days in most years.
VI	The soil profile is wet within 40 cm depth for more than 335 days in most years.

#### Assessment of Wetness Class

Soils have been allocated to wetness classes by the interpretation of soil profile characteristics and climatic factors using the methodology described in *Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land* (MAFF, 1988).

<sup>1</sup> The number of days is not necessarily a continuous period.

<sup>2</sup> 'In most years' is defined as more than 10 out of 20 years.



**APPENDIX III**

**SOIL DATA**

**Contents:**

**Sample location map**

**Soil abbreviations - Explanatory Note**

**Soil Pit Descriptions**

**Soil boring descriptions (boring and horizon levels)**

**Database Printout - Horizon Level Information**

SAMPLE NO.	GRID REF	ASPECT		--WETNESS--		-WHEAT-		-POTS-		M.REL		EROSN	FROST	CHEM	ALC	COMMENTS	
		USE	GRDNT	GLEY	SPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST		LIMIT
1	SU508 140	PGR		000	040	4	3B	091	-13	100	3	3A			WE	3B	
1P	SU507 137	ARA	NW	02	025 025	4	3B	080	-24	083	-14	3B			WE	3B	DEEPER
2	SU506 136	ARA	NW	03	000 038	4	3B	000	0	000	0			WE	3B		
3	SU504 134	PGR	NW		035 035	4	3B	000	0	000	0			WE	3B		
4	SU501 134	PGR	NW		000	1	1	000	0	000	0			DR	3B	Q DISTRB	
5	SU506 135	ARA	SW	04	050 050	3	2	120	16	105	8	2		WE	2	DEEPER	
6	SU510 138	PGR	SW		000 028	4	3B	000	0	000	0			WE	3B		
7	SU513 138	ARA	SW		050 050	3	3A	000	0	000	0			WE	3A		
8	SU516 136	ARA	SW		030 030	4	3B	000	0	000	0			WE	3B		
9	SU508 136	ARA	NW	03	040 050	3	2	116	12	105	8	2		WE	2		

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED		----STONES----			STRUCT/ CONSIST	SUBS				
				COL	ABUN	CONT	COL.	GLEYS	>2	>6	LITH		TOT	STR	POR	IMP	SPL
1	0-30	mc1	10YR52 00 000C00 00 M					Y	0	0	HR	2					
	30-40	sc1	25Y 52 00 000C00 00 M					Y	0	0		0		M			
	40-65	c	25Y 63 00 000C00 00 M					Y	0	0		0		P	Y		Y
1P	0-25	mc1	10YR42 00 000C00 00 F							1	0	HR	2				
	25-55	c	25Y 63 00 10YR5B 00 M				05Y 53 00	Y	0	0		0	MASSIV FM	P	Y		Y
2	0-38	hc1	10YR42 00 000C00 00 C					Y	2	0	HR	5					
	38-65	c	25Y 63 00 000C00 00 M					Y	0	0		0		P	Y		Y
3	0-35	mc1	10YR43 00 000C00 00 F							0	0	HR	2				
	35-60	c	25Y 63 00 000C00 00 C					Y	0	0		0		P	Y		Y
4	0-35	ms1	10YR43 00							0	0	HR	2				
5	0-35	ms1	10YR43 00							0	0	HR	5				
	35-50	sc1	10YR53 00							0	0	HR	2		M		
	50-80	c	25Y 63 00 000C00 00 C					Y	0	0		0		P	Y		Y
	80-100	sc1	25Y 64 00 000C00 00 C					Y	0	0		0		M			Y
6	0-28	mc1	10YR42 00 000C00 00 C					Y	0	0	HR	2					
	28-60	c	25Y 64 00 000C00 00 M					Y	0	0		0		P	Y		Y
7	0-35	mc1	10YR32 00							2	0	HR	10				
	35-50	sc1	10YR54 00							0	0	HR	10		M		
	50-70	c	25Y 63 64 000C00 00 C					Y	0	0		0		P	Y		Y
8	0-30	mc1	10YR43 00 000C00 00 F							0	0	HR	2				
	30-55	c	25Y 64 00 000C00 00 M					Y	0	0		0		P	Y		Y
9	0-30	ms1	10YR43 00							1	0	HR	3				
	30-40	sc1	10YR54 00							0	0	HR	1		M		
	40-50	sc1	10YR54 00 000C00 00 C					S	0	0		0		M			
	50-80	c	25Y 64 00 000C00 00 M					Y	0	0		0		P	Y		Y
	80-100	c	25Y 64 00 000C00 00 M					Y	0	0		0		M			Y

SOIL PIT DESCRIPTION

Site Name : BOTLEY, EASTLEIGH LP Pit Number : 1P

Grid Reference: SU507 137 Average Annual Rainfall : 847 mm  
 Accumulated Temperature : 1497 degree days  
 Field Capacity Level : 173 days  
 Land Use : Arable  
 Slope and Aspect : 02 degrees NW

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 25	MCL	10YR42 00	1	2	HR	F				
25- 55	C	25Y 63 00	0	0		M	MASSIV	FM	P	

Wetness Grade : 3B Wetness Class : IV  
 Gleying : 025 cm  
 SPL : 025 cm

Drought Grade : 3B APW : 080mm MBW : -24 mm  
 APP : 083mm MBP : -14 mm

FINAL ALC GRADE : 3B  
 MAIN LIMITATION : Wetness

## SOIL PROFILE DESCRIPTIONS: EXPLANATORY NOTE

Soil pit and auger boring information collected during ALC fieldwork is held on a computer database. This uses notations and abbreviations as set out below.

### Boring Header Information

1. **GRID REF:** national 100 km grid square and 8 figure grid reference.
2. **USE:** Land use at the time of survey. The following abbreviations are used.

<b>ARA:</b> Arable	<b>WHT:</b> Wheat	<b>BAR:</b> Barley
<b>CER:</b> Cereals	<b>OAT:</b> Oats	<b>MZE:</b> Maize
<b>OSR:</b> Oilseed rape	<b>BEN:</b> Field Beans	<b>BRA:</b> Brassicae
<b>POT:</b> Potatoes	<b>SBT:</b> Sugar Beet	<b>FCD:</b> Fodder Crops
<b>LIN:</b> Linseed	<b>FRT:</b> Soft and Top Fruit	<b>FLW:</b> Fallow
<b>PGR:</b> Permanent Pasture	<b>LEY:</b> Ley Grass	<b>RGR:</b> Rough Grazing
<b>SCR:</b> Scrub	<b>CFW:</b> Coniferous Woodland	<b>DCW:</b> Deciduous Wood
<b>HTH:</b> Heathland	<b>BOG:</b> Bog or Marsh	<b>FLW:</b> Fallow
<b>PLO:</b> Ploughed	<b>SAS:</b> Set aside	<b>OTH:</b> Other
<b>HRT:</b> Horticultural Crops		

3. **GRDNT:** Gradient as estimated or measured by a hand-held optical clinometer.
4. **GLEYSPL:** Depth in centimetres (cm) to gleying and/or slowly permeable layers.
5. **AP (WHEAT/POTS):** Crop-adjusted available water capacity.
6. **MB (WHEAT/POTS):** Moisture Balance. (Crop adjusted AP - crop adjusted MD)
7. **DRT:** Best grade according to soil droughtiness.
8. If any of the following factors are considered significant, 'Y' will be entered in the relevant column.

**MREL:** Microrelief limitation    **FLOOD:** Flood risk    **EROSN:** Soil erosion risk  
**EXP:** Exposure limitation    **FROST:** Frost prone    **DIST:** Disturbed land  
**CHEM:** Chemical limitation

9. **LIMIT:** The main limitation to land quality. The following abbreviations are used.

<b>OC:</b> Overall Climate	<b>AE:</b> Aspect	<b>EX:</b> Exposure
<b>FR:</b> Frost Risk	<b>GR:</b> Gradient	<b>MR:</b> Microrelief
<b>FL:</b> Flood Risk	<b>TX:</b> Topsoil Texture	<b>DP:</b> Soil Depth
<b>CH:</b> Chemical	<b>WE:</b> Wetness	<b>WK:</b> Workability
<b>DR:</b> Drought	<b>ER:</b> Erosion Risk	<b>WD:</b> Soil Wetness/Droughtiness
<b>ST:</b> Topsoil Stoniness		

## Soil Pits and Auger Borings

1. **TEXTURE:** soil texture classes are denoted by the following abbreviations.

<b>S:</b> Sand	<b>LS:</b> Loamy Sand	<b>SL:</b> Sandy Loam
<b>SZL:</b> Sandy Silt Loam	<b>CL:</b> Clay Loam	<b>ZCL:</b> Silty Clay Loam
<b>ZL:</b> Silt Loam	<b>SCL:</b> Sandy Clay Loam	<b>C:</b> Clay
<b>SC:</b> Sandy Clay	<b>ZC:</b> Silty Clay	<b>OL:</b> Organic Loam
<b>P:</b> Peat	<b>SP:</b> Sandy Peat	<b>LP:</b> Loamy Peat
<b>PL:</b> Peaty Loam	<b>PS:</b> Peaty Sand	<b>MZ:</b> Marine Light Silts

For the sand, loamy sand, sandy loam and sandy silt loam classes, the predominant size of sand fraction will be indicated by the use of the following prefixes:

<b>F:</b> Fine (more than 66% of the sand less than 0.2mm)
<b>M:</b> Medium (less than 66% fine sand and less than 33% coarse sand)
<b>C:</b> Coarse (more than 33% of the sand larger than 0.6mm)

The clay loam and silty clay loam classes will be sub-divided according to the clay content: **M:** Medium (<27% clay) **H:** Heavy (27-35% clay)

2. **MOTTLE COL:** Mottle colour using Munsell notation.
3. **MOTTLE ABUN:** Mottle abundance, expressed as a percentage of the matrix or surface described.

**F:** few <2% **C:** common 2-20% **M:** many 20-40% **VM:** very many 40% +

4. **MOTTLE CONT:** Mottle contrast  
**F:** faint - indistinct mottles, evident only on close inspection  
**D:** distinct - mottles are readily seen  
**P:** prominent - mottling is conspicuous and one of the outstanding features of the horizon

5. **PED. COL:** Ped face colour using Munsell notation.
6. **GLEYS:** If the soil horizon is gleyed a 'Y' will appear in this column. If slightly gleyed, an 'S' will appear.

7. **STONE LITH:** Stone Lithology - One of the following is used.

<b>HR:</b> all hard rocks and stones	<b>SLST:</b> soft oolitic or dolimitic limestone
<b>CH:</b> chalk	<b>FSST:</b> soft, fine grained sandstone
<b>ZR:</b> soft, argillaceous, or silty rocks	<b>GH:</b> gravel with non-porous (hard) stones
<b>MSST:</b> soft, medium grained sandston	<b>GS:</b> gravel with porous (soft) stones
<b>SI:</b> soft weathered igneous/metamorphic rock	

Stone contents (>2cm, >6cm and total) are given in percentages (by volume).

8. **STRUCT**: the degree of development, size and shape of soil peds are described using the following notation:

degree of development    **WK**: weakly developed    **MD**: moderately developed  
   **ST**: strongly developed

ped size                            **F**: fine                                    **M**: medium  
   **C**: coarse                                **VC**: very coarse

ped shape                        **S** : single grain                        **M**: massive  
   **GR**: granular                            **AB**: angular blocky  
   **SAB**: sub-angular blocky        **PR**: prismatic  
   **PL**: platy

9. **CONSIST**: Soil consistence is described using the following notation:

**L**: loose    **VF**: very friable    **FR**: friable    **FM**: firm    **VM**: very firm  
**EM**: extremely firm            **EH**: extremely hard

10. **SUBS STR**: Subsoil structural condition recorded for the purpose of calculating profile droughtiness: **G**: good    **M**: moderate    **P**: poor

11. **POR**: Soil porosity. If a soil horizon has less than 0.5% biopores >0.5 mm, a 'Y' will appear in this column.

12. **IMP**: If the profile is impenetrable to rooting a 'Y' will appear in this column at the appropriate horizon.

13. **SPL**: Slowly permeable layer. If the soil horizon is slowly permeable a 'Y' will appear in this column.

14. **CALC**: If the soil horizon is calcareous, a 'Y' will appear in this column.

15. Other notations

**APW**: available water capacity (in mm) adjusted for wheat  
**APP**: available water capacity (in mm) adjusted for potatoes  
**MBW**: moisture balance, wheat  
**MBP**: moisture balance, potatoes.